The effect of exercise training on cardiac remodeling in adolescents with corrected tetralogy of Fallot and Fontan circulation:

A randomized controlled trial.

CONCLUSION:

Aerobic exercise training did not result in adverse cardiac remodeling in patients with either a corrected tetralogy of Fallot or Fontan circulation.

Background:

Current public-health guidelines suggest > 60 minutes of moderate-to-vigorous daily physical activity for adolescents. Many adolescents with congenital heart disease do not meet these guidelines. Limited knowledge on the effect of exercise on cardiac remodelling in these patients may hamper executing the guidelines. We hypothesized that exercise training would not lead to adverse cardiac remodeling.

Methods:

- Multicentre randomized controlled trial
- Patients:
  - Corrected tetralogy of Fallot (ToF)
  - Fontan circulation (Fontan)
  - age range 10-25 years
- Tests before (V1) and after (V2) 12 weeks:
  - MRI (volumes indexed by BSA (i))
  - Echocardiography
- Intervention group:
  - supervised aerobic exercise training
  - 3 one-hour sessions per week
  - 60-70% of heart rate reserve
- Control group did not change their lifestyle

Results:

- Total participants 93; drop-out 3 (exercise-group)
  - Exercise  n = 53; male 40; age 15 ± 3 years
  - Control n = 37; male 26; age 16 ± 3 years
  - ToF n = 47 (27 exercise; n = 20 control)
  - Fontan n = 43 (26 exercise; n = 17 control)

Discussion:

- No significant changes in systolic function in patients with corrected tetralogy of Fallot or Fontan circulation.
- No clinically relevant changes in diastolic function in patients with corrected tetralogy of Fallot or Fontan circulation.
- Change of the perception of cardiac youth being "at risk" during exercise.

Funded by the Dutch Heart Foundation; grant 2008B026
Contact: n.duppen@erasusmc.nl